LISTING OF CLAIMS

1. (original) A method of synchronizing a plurality of clocks at different locations using a third clock (clock B) comprising the steps of:

determining a correction term, ε^A for a first one of the plurality of clocks (clock A) the correction term being the difference between the computed arrival time of a signal from clock B to clock A if clock A was synchronized to clock B, defined as s_1^A, minus the observed time by clock A of arrival of the signal from clock B at clock A;

determining a correction term, ε^C for any selected one or ones of the plurality of clocks (clocks C) to be synchronized, the correction term being the difference between the computed arrival time of a signal from clock B to clock C if clock C was synchronized to clock B, defined as s_2^A minus the observed time by clock C of arrival of the signal from clock B at clock C;

applying the difference between the correction terms, ε^A and ε^C, defining a correction term, ε^{CA} for clock C, to synchronize the selected one or ones of the plurality of clocks C for which ε^C has been determined, to clock A.

2. (original) The method of claim 1 wherein s_1^A is computed according to:

$$s_1^A = t_1^B + \frac{d^{AB}}{c - v_r^{AB}}$$

where;

t_1^B is the time of transmission of the signal from clock B according to clock B;

d^{AB} is the distance from clock A to clock B at the time t_1^B;

c is the velocity of light in a vacuum;

v_r^{AB} is the radial velocity of clock B relative to clock A at the time t_1^B;

3. (original) The method of claim 1 wherein clock B is in a GPS satellite and the signal from the satellite has ephemeris data to allow calculation of d^{AB} and v_r^{AB}.

4. (original) The method of claim 3 wherein clocks A and C are on the earth.

5. (original) The method of claim 3 wherein clock A is on the earth and clock C is on a satellite and clock C has its position and velocity computed timely for calculation of ε^C.

6. (original) The method of claim 3 wherein clock A is on a satellite and clock C is on a satellite and both clock A and clock C have their position and velocity computed timely for calculation ε^A and ε^C respectively.

7. (currently amended) A method of synchronizing a plurality of clocks at different locations on earth using a clock in a satellite that is in translation relative to the clocks on earth, where an arbitrary one of the clocks on earth is referred to as clock A and an arbitrary other of the clocks on earth is referred to as clock C, and the clock in the satellite is referred to as clock B, and where the process can be used with a single defined clock A, or by designating any clock of the plurality of clocks as clock A, and any other of the clocks of the plurality of clocks as clock B comprising the steps of;

stage 1, at clock A

receiving the signal from clock B;

recording the time t_1^A, of reception of a specific epoch according to clock A;

recording the time t_1^B, of transmission of the epoch according to clock B;

determining the location, x_1^B, y_1^B, z_1^B, and velocity vector $\overline{v}_1^B$, of B at the time t_1^B, of the epoch transmission;

determining the radial component v_r^{AB} of relative velocity between clock A and clock B;

determining at clock A the propagation time of the signal epoch in traveling from A to B, t_{prop}^{BA};

determining the epoch arrival time s^A, at clock A;

determining the correction term for clock A, ε^A;

stage 2, at clock ~~[[B]]~~ <u>C</u>

receiving the signal from clock B;

recording the time t_2^C of reception of a specific epoch according to clock C;

recording the time t_2^B of transmission of the epoch according to clock B;

determining the location x_2^B, y_2^B, z_2^B, and

the velocity vector $\overline{v}_2^B$ of B at the time t_2^B of the specific epoch transmission;

determining the radial component v_r^{CB} of relative velocity between clock C and clock B;

determining at clock C the propagation time of the signal epoch in traveling from clock B to clock C, t_{prop}^{BC};

determining the epoch arrival time , s_2^C at clock C;

determining correction term for clock C, ε^{C};

stage 3, at clock C

differencing the correction term ε^{C} and ε^{A} to determine ε^{CA};

synchronizing clock C to clock A by applying ε^{CA} to the unsynchronized reading of clock C.

8. (original) The method of claim 7 wherein s_1^A is computed according to:

$$s_1^A = t_1^B + \frac{d^{AB}}{c - v_r^{AB}}$$

where;

t_1^B is the time of transmission of the signal from clock B according to clock B;

d^{AB} is the distance from clock A to clock B at the time t_1^B;

c is the velocity of light in a vaccum;

v_r^{AB} is the radial velocity of clock B relative to clock A at the time t_1^B;

9. (original) The method of claim 7 wherein clock B is in a GPS satellite and the signal from the satellite has ephemeris data to allow calculation of d^{AB} and v_r^{AB}.

10. (original) The method of claim 7 wherein clocks A and C are on the earth.

11. (original) The method of claim 7 wherein clock A is on the earth and clock C is on a satellite and clock C has its position and velocity computed timely for calculation of ε^C.

12. (original) The method of claim 7 wherein clock A is on a satellite and clock C is on a satellite and both clock A and clock C have their position and velocity computed timely for calculation ε^A and ε^C respectively.

13. (original) A method of synchronizing a clock in a satellite to a clock on the earth, comprising the steps of:

transmitting a signal S_w from a first clock (clock A) at time t_1^A according to clock A;

recording at clock A the time t_1^A of transmission of signal S_w.

recording at the location of the clock in the satellite (clock B) the time t_1^B that signal S_w is received by clock B;

at time t_1^B or at a time known relative to time t_1^B, transmitting a signal S_x from the satellite, said signal S_x containing a message indicating the value of t_1^B;

recording at clock A the time t_2^A that signal S_x is received by clock A, and recording the value of t_1^B from the message contained in signal S_x;

at time t_2^A or at a time known relative to time t_2^A, transmitting a signal S_y from clock A;

receiving the signal at clock B at time t_1^B according to clock B;

at time t_2^B or at a time known relative to time t_2^B, transmitting a signal S_z from clock B;

recording at clock A the time t_3^A that signal S_z is received by clock A;

determining the characteristic value ξ of relative motion according to the expression

$$\xi = \left(\frac{t_3^A - t_2^A}{t_2^A - t_1^A} \right)^{\frac{1}{2}};$$

obtaining the synchronized time s_1^B of reception of signal S_w according to the formula

$$s_1^B = \frac{1}{\xi + 1}\left(t_2^A + \xi t_1^A\right);$$

determining a correction term ε^B, which is $s_1^B - t_1^B$;

sending the value of ε^B to the satellite and having the satellite broadcast the value of ε^B along with its unsynchronized time t^B, or sending the value of ε^B to the satellite and having the satellite use ε^B in conjunction with t^B to broadcast a synchronized time.

14. (original) A method of synchronizing a clock in a satellite to a clock on the earth, comprising the steps of:

transmitting a signal S_w from a reference clock (clock A) at time t_1^A according to clock A, said signal S_w containing a message indicating the value of t_1^A;

recording at the location of the clock in the satellite (clock B) the time t_1^B that signal S_w is received by clock B, and recording the value of t_1^A from the message contained in signal S_w;

at time t_1^B or at a time known relative to time t_1^B, transmitting a signal S_x from the satellite;

recording at clock A the time t_2^A that signal S_x is received by clock A;

at time t_2^A or at a time known relative to time t_2^A, transmitting a signal S_y from clock A, said signal S_y containing a message indicating the value of t_2^A;

recording at clock B the time t_2^B that signal S_y is received by clock B, and recording the value of t_2^A from the message contained in signal S_y;

determining the characteristic value ξ of relative motion according to the expression

$$\xi = \frac{t_2^B - t_1^B}{t_2^A - t_1^A};$$

obtaining the synchronized time s_1^B of reception of signal S_w according to the formula

$$s_1^B = \frac{1}{\xi + 1}\left(t_2^A + \xi t_1^A\right);$$

determining a correction term ε^B, which is $s_1^B - t_1^B$;

having the satellite broadcast the value of ε^B along with its unsynchronized time t^B, or sending the value of ε^B to the satellite and having the satellite use ε^B in conjunction with t^B to broadcast a synchronized time.